SBC84833 Series

Intel® Atom™ Processor N270

Capa Board with LVDS

User's Manual

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Caution

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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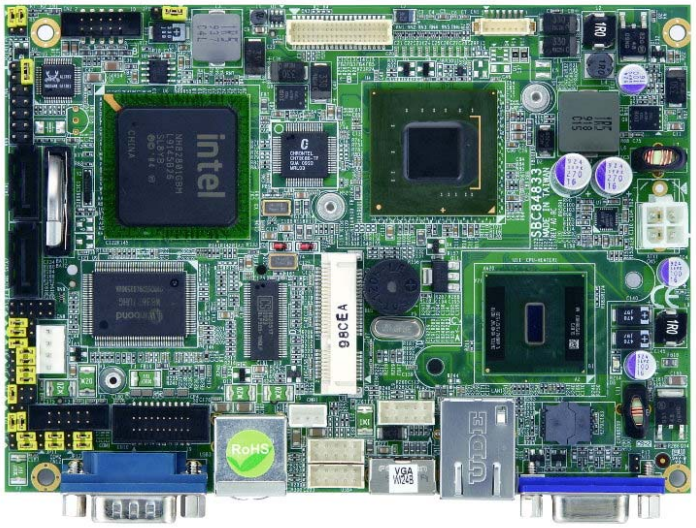
CHAPTER 1
INTRODUCTION



The **SBC84833**, a Capa board, supports Intel® Atom™ processor N270, at FSB 533 MHz. The board integrates chipsets Intel® 945GSE and ICH7M that deliver outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions. There is one 200-pin unbuffered SO-DIMM sockets for singe channel DDR2-400/533 MHz memory, maximum memory capacity up to 2GB. It also features one Gigabit/Fast Ethernet, two serial ATA channels for total two Serial ATA hard drives at maximum transfer rate up to 150MB/sec, seven USB 2.0 high speed compliant, built-in HD audio codec that can achieve the best stability and reliability for industrial applications. Additionally, it provides you with unique embedded features, such as 4 serial ports and 3.5" form factor that applies an extensive array of PC peripherals.

1.1 Specifications

- **CPU**
  - **Intel® Atom™ processor N270**
- **System Chipset**
  - **Intel® 945GSE & ICH7M**
- **Front-Side Bus**
  - **533 MHz**
- **BIOS**
  - American Megatrends Inc. BIOS.
  - 8Mbit SPI Flash, DMI, Plug and Play
  - "Load Optimized Default" to backup customized Setting in the BIOS flash chip to prevent from CMOS battery fail
- **System Memory**
  - One 200-pin unbuffered DDR2 SO-DIMM sockets
  - Maximum to 2GB DDR2 400/533 MHz memory

- **Onboard Multi I/O**
  - Controller: Winbond W83627UHG
  - Serial Ports: One port for RS-232/422/485 and three ports for RS-232
  - Two SATA-150 connectors
- **CompactFlash™ Socket**
  - One CompactFlash™ Type II Socket
- **USB Interface**
  - Seven USB ports with fuse protection and complies with USB Spec. Rev. 2.0
- **Display**
  - CRT connector
  - One 40-pin connector for 18 single channel LVDS and one 7-pin inverter connector
  - One 40-pin 24-bit single/dual channel LVDS via Chrontel CH7308B from SDVO as EFP port and one 7-pin inverter connector
- Watchdog Timer
  - 1~255 seconds; up to 255 levels
- **Ethernet**
  - One port with RTL8111DL for Gigabit/Fast Ethernet
- **Audio**
  - HD Audio compliant (with Speaker/line-out & MIC-in) via ALC662
  - Internal Audio features for speaker-out & MIC-in & Line-in via Box Header connector
- **Power Management**
  - ACPI (Advanced Configuration and Power Interface)
- **Form Factor**
  - 3.5" form factor

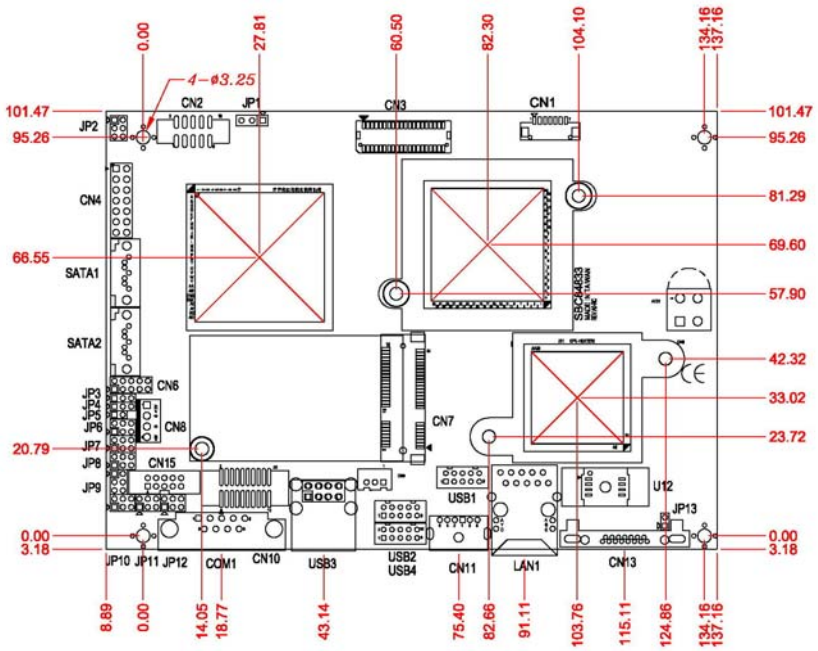
NOTE *All specifications and images are subject to change without notice.*

1.2 Utilities Supported

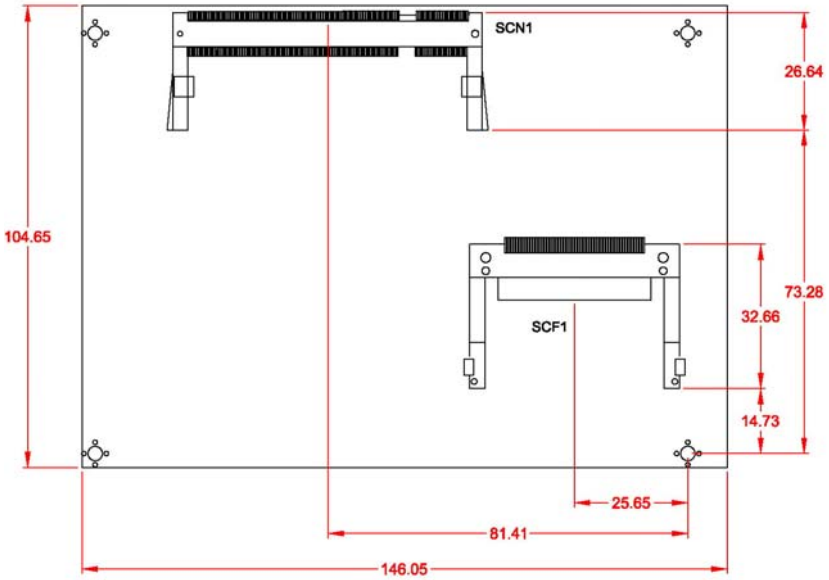
- Chipset Driver
- Ethernet Driver
- Graphic Driver
- Audio Driver

CHAPTER 2
JUMPERS AND CONNECTORS

2.1 Board Dimensions and Fixing Holes

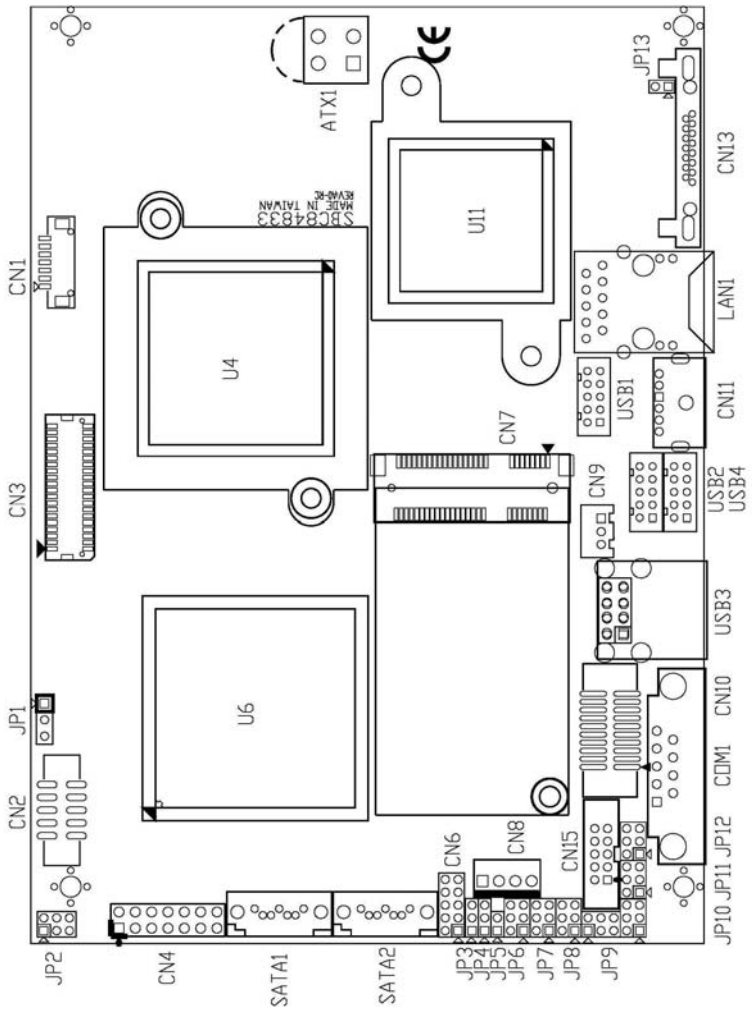


Component Side

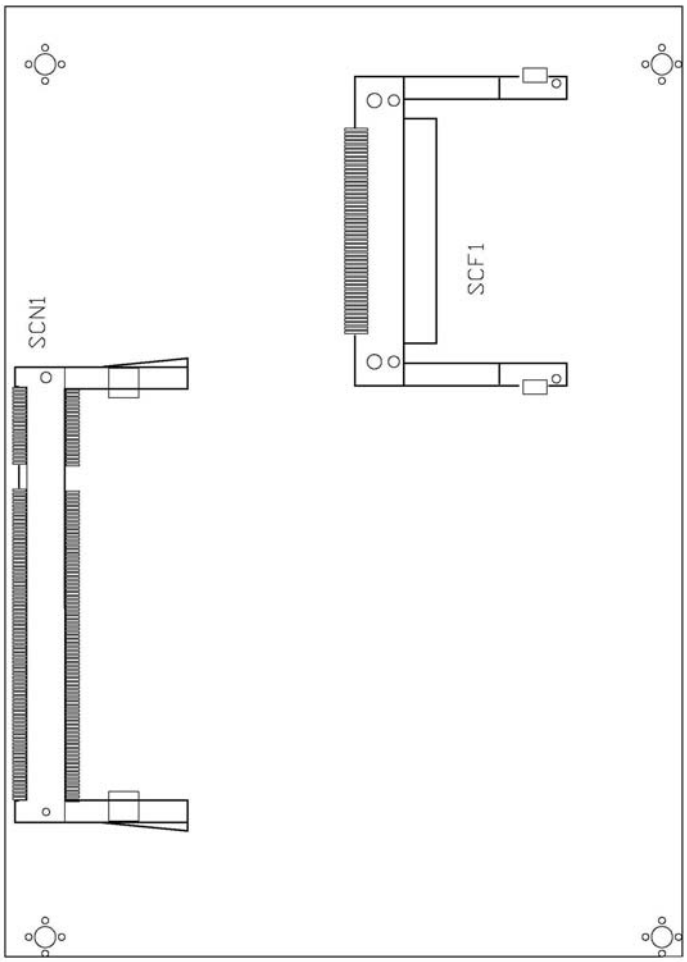


Solder Side

2.2 Board Layout



Component Side



Solder Side

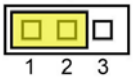
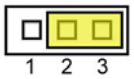
2.3 Jumper Settings

Proper jumer settings configure the **SBC84833** to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

Jumper	Default Setting		Jumper Setting
JP1	LVDS Voltage Selection Default: 3.3V		Short 1-2
JP2	Audio Speak Out/Line Out Selection Default: Line Out		Short 1-3, 2-4
JP3	Compact Flash Voltage Selection Default: 3.3V		Short 1-2
JP4	Normal Operation/Clear CMOS setting Default: Normal Operation		Short 1-2
JP5	Auto Power ON Default: Disable		Short 1-2
JP6	COM1 RS-232/422/485 Mode setting Default: RS-232		Short 3-5、4-6
JP7			Short 3-5、4-6
JP8			Short 1-2
JP9	COM2 Mode Select	COM2 Pin 1: DCD	Short 3-5
		COM2 Pin 8: RI	Short 4-6
JP10	COM1 Mode Select	COM1 Pin 1: DCD	Short 3-5
		COM1 Pin 8: RI	Short 4-6
JP11	COM3 Mode Select	COM3 Pin 1: DCD	Short 3-5
		COM3 Pin 9: RI	Short 4-6
JP12	COM4 Mode Select	COM4 Pin 1: DCD	Short 3-5
		COM4 Pin 8: RI	Short 4-6

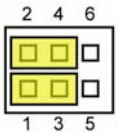
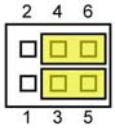
2.3.1 LCD Voltage Slection Jumper (JP1)

The board supports +3.3V or +5V flat panel displays. Configure the jumper JP1 to the appropriate voltage of the flat panel.

Description	Function	Jumper Setting
LCD Voltage Selection	3.3V (Default)	
	5V	

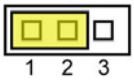
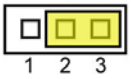
2.3.2 Audio Output Jumper (JP2)

This jumper is to select the Audio output.

Description	Function	Jumper Setting
Audio Output	Line Out (Default)	
	Speaker Out	

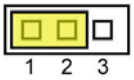
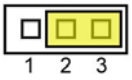
2.3.3 CompactFlash™ Voltage Jumper (JP3)

The jumper is to select the voltage for CompactFlash™ interface.

Description	Function	Jumper Setting
Compact Flash Voltage Selection	3.3V (Default)	
	5V	

2.3.4 CMOS Clear Jumper (JP4)

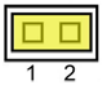
You may need to use this jumper is to clear the CMOS memory if incorrect settings in the Setup Utility.

Description	Function	Jumper Setting
CMOS Clear	Normal (Default)	
	Clear CMOS	

2.3.5 Auto Power On Jumper (JP5)

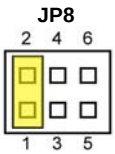
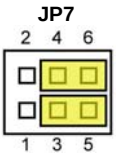
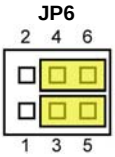
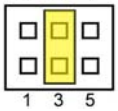
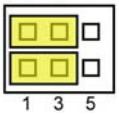
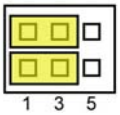
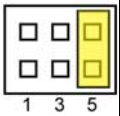
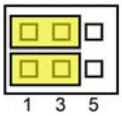
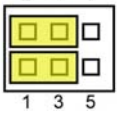
When Jumper JP5 is set OPEN for AC power input, the system will be automatically power ON without pressing soft power button; when JP5 is SHORT for AC power input, it is necessary to manually press soft power button to make the system power ON.

Note *This function is similar to the feature of Power On after Power Failed, which is controlled by hardware circuitry instead of BIOS.*

Description	Function	Jumper Setting
Auto Power On	Disable (Default)	
	Enable	

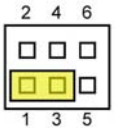
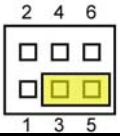
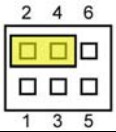
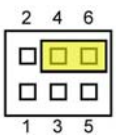
2.3.6 COM1 Mode Select Jumpers (JP6, JP7, JP8)

These jumpers select the communication mode of COM1 port to operate RS-232 or RS-422 or RS-485.

Description	Function	Jumper Setting		
COM 1	RS-232 (Default)	JP8 	JP7 	JP6 
	RS-422	JP8 	JP7 	JP6 
	RS-485	JP8 	JP7 	JP6 

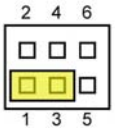
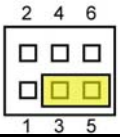
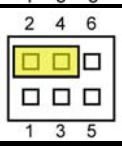
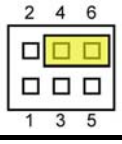
2.3.7 COM2 Mode Selection Jumper (JP9)

The jumper selects the DCD and RI mode of CN15 COM2 port.

Description	Function	Jumper Setting
COM2	CN15 Pin 1=5V	
	CN15 Pin 1=DCD (Default)	
	CN15 Pin 8=12V	
	CN15 Pin 8=RI (Default)	

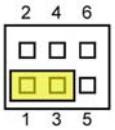
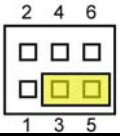
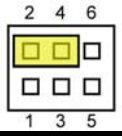
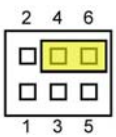
2.3.8 COM1 Mode Selection Jumper (JP10)

The jumper selects the DCD and RI mode of COM1 port.

Description	Function	Jumper Setting
COM1	Pin 1=5V	
	Pin 1=DCD (Default)	
	Pin 8=12V	
	Pin 8=RI (Default)	

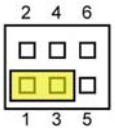
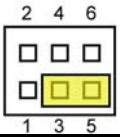
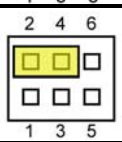
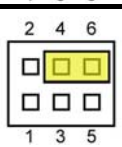
2.3.9 COM3 Mode Selection Jumper (JP11)

The jumper selects the DCD and RI mode of CN10 COM3 port.

Description	Function	Jumper Setting
COM3	CN10 Pin 1=5V	
	CN10 Pin 1=DCD (Default)	
	CN10 Pin 8=12V	
	CN10 Pin 8=RI (Default)	

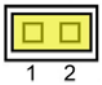
2.3.10 COM4 Mode Selection Jumper (JP12)

The jumper selects the DCD and RI mode of CN10 COM4 port.

Description	Function	Jumper Setting
COM4	CN10 Pin 11=5V	
	CN10 Pin 11=DCD (Default)	
	CN10 Pin 18=12V	
	CN10 Pin 18=RI (Default)	

2.3.11 CRT Always On Jumper (JP13)

When Jumper is set Enable, the screen is always output by CRT.

Description	Function	Jumper Setting
CRT Always On	Disable	
	Enable (Default)	

2.4 Connectors

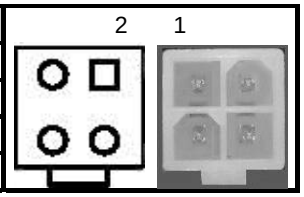
Connectors connect the board with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected. Here is a summary table which shows you all connectors on the **SBC84833** Series.

Connectors	Label
Inverter Connector	CN1
Audio Connector	CN2
LVDS Connector	CN3
Front Panel Connector	CN4
2*5Pin DIO Connector	CN6
Mini PCI-Express Card Connector	CN7
ATX 4 Pin 12V In	CN8
SMBus Connector	CN9
COM3, COM4 Connector	CN10
Keyboard and PS/2 Mouse Connector	CN11
VGA Connector	CN13
COM1 Connector	COM1
COM2 Connector	CN15
Serial ATA1 Connector	SATA1
Serial ATA2 Connector	SATA2
USB2, USB3 Connector	USB1
USB6, USB7(Optional) Connector	USB2
USB0 Connector	USB3
USB4, USB5 Connector	USB4
Compact Flash Connector	SCF1
DDRII SO-DIMM Connector	SCN1
Power Connector	ATX1
Ethernet Connector	LAN1

2.4.1 ATX 4 Pin 12V Connector (ATX1)

Connect it to the power supply ATX12V power.

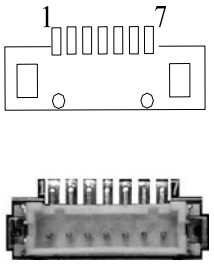
Pin	Signal
1	GND
2	GND
3	+12V
4	+12V



2.4.2 LVDS Backlight Connector (CN1)

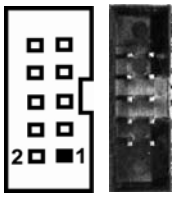
The **CN1** is DF13-7S-1.25C 7-pin connectors for inverter, We strongly recommend you to use the matching DF13-7S-1.25C connector.

Pin	Signal
1	+12V
2	+12V
3	+5V
4	ENABLE
5	GND
6	GND
7	GND



2.4.3 Audio Phone Jack Connector (CN2)

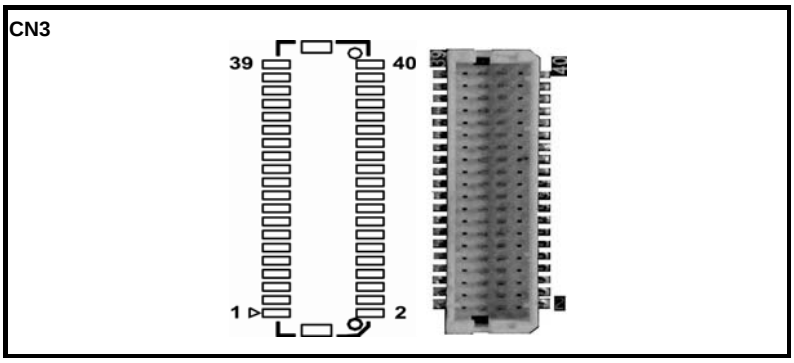
Pin	Signal	Pin	Signal
1	MIC_IN	2	Ground (GND)
3	LINE_IN_L	4	Ground (GND)
5	LINE_IN_R	6	Ground (GND)
7	AUDIO_OUT_L	8	Ground (GND)
9	AUDIO_OUT_R	10	Ground (GND)



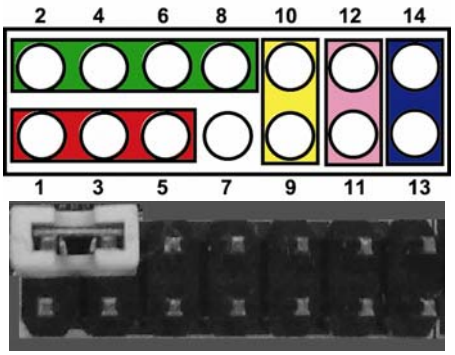
2.4.4 LVDS Flat Panel Connector (CN3)

The board has a 40-pin connector **CN3** for LVDS Interface LCD. It is strongly recommended to use the matching GLA1001WV-S-2x20P 40-pin connector for LVDS on the board.

Pin	Signal	Pin	Signal
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	Channel B D3- (24-Bit support)	12	Channel B D0-
13	Channel B D3+ (24-Bit support)	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	Channel A D3- (24-Bit support)
31	Channel A D1+	32	Channel A D3+ (24-Bit support)
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND



2.4.5 Flat Panel Bezel Connector (CN4)



- **Power LED**

  Pin 1 and Pin 5 connect the system power LED indicator with the corresponding switch on the case. Pin 1 is assigned as +, and Pin 3 & Pin 5 as -. The Power LED lights up when the system is powered ON. Pin 3 is defined as GND

- **External Speaker and Internal Buzzer Connector**

  Pin 2, 4, 6 and 8 connect the case-mounted speaker unit or internal buzzer. While connecting the CPU card to an internal buzzer, please short pins 2,4; while connecting to an external speaker, you need to set pins 2,4 to Open and connect the speaker cable to pin 8 (+) and pin 6 (-).

- **ATX Power On/Off Button**

  Pin 9 and 10 connect the ATX power button on front panel to the CPU card, which allows users to control ATX power supply to be power on/off.

- **System Reset Switch**
  Pin 11 and 12 connect the case-mounted reset switch that reboots your computer without turning OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

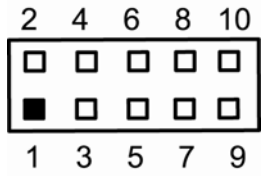
- **HDD Activity LED**

  This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, Pin 13 assigned as -, and Pin 14 as +.

2.4.6 Digital I/O Port Connector (CN6)

The board is equipped with a 8-channel (3in, 5out) digital I/O connector that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. The digital I/O is controlled via software programming. (The application method can be referred to Appendix B.)

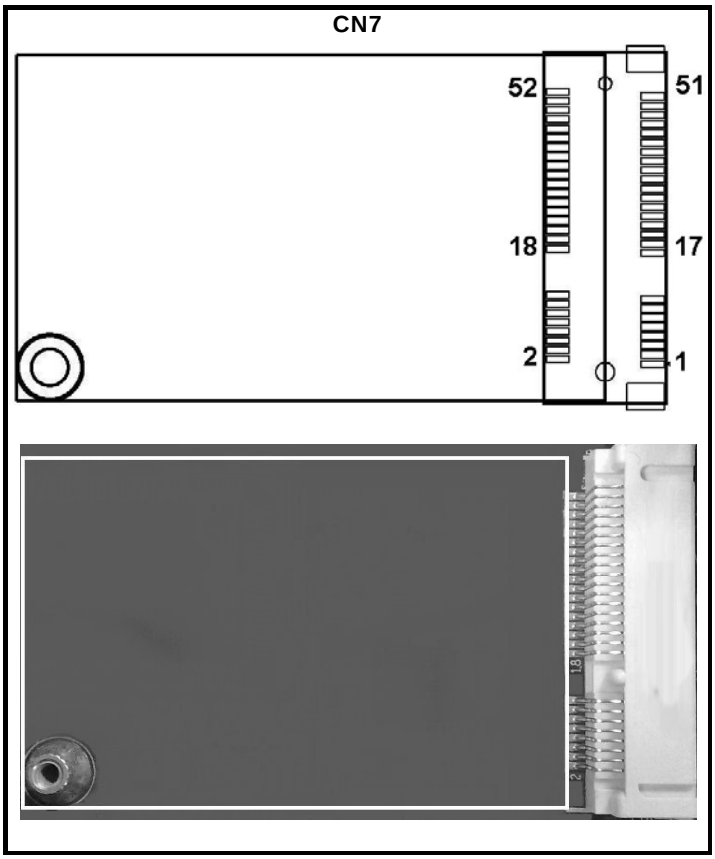
Pin	Signal	Pin	Signal
1	Digital Input 0	2	Digital Output 0
3	Digital Input 1	4	Digital Output 1
5	Digital Input 2	6	Digital Output 2
7	Ground (GND)	8	Digital Output 3
9	Ground (GND)	10	Digital Output 4



2.4.7 Mini PCI-Express Card Connector (CN7)

CN7 is a PCI Express Mini Card connector with support for a PCI Express x1 link and a USB 2.0 link. A PCI Express Mini Card can be applied to either PCI Express or USB 2.0. The USB 2.0 support will be helpful during the transition to PCI Express, because peripheral vendors will need time to design their chipsets to have the PCI Express function. During the transition, PCI Express Mini Cards can be quickly implemented by using USB 2.0.

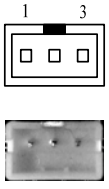
Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3V
3	N.C	4	GND
5	N.C	6	+1.5V
7	GND	8	N.C
9	GND	10	N.C
11	CLK-	12	N.C
13	CLK+	14	N.C
15	GND	16	N.C
17	N.C	18	GND
19	N.C	20	N.C
21	GND	22	PERST#
23	PERN3	24	+3.3VSB
25	PERP3	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETN3	32	SMB_DATA
33	PETP3	34	GND
35	GND	36	USB_D7-
37	N.C	38	USB_D7+
39	N.C	40	GND
41	N.C	42	N.C
43	N.C	44	N.C
45	N.C	46	N.C
47	N.C	48	+1.5V
49	N.C	50	GND
51	N.C	52	+3.3V



2.4.8 SMBus Connector (CN9)

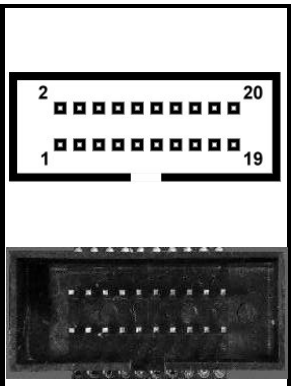
Connector CN9 is for SMBUS interface support.

Pin	Signal
1	CLOCK
2	DATA
3	GND



2.4.9 Serial Port3 & Serial Port4 (CN10)

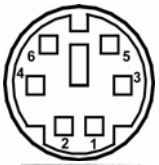
Pin	Signal	Pin	Signal
1	DCD3	2	DSR3
3	RXD3	4	RTS3
5	TXD3	6	CTS3
7	DTR3	8	RI3
9	GND	10	N.C.
11	DCD4	12	DSR4
13	RXD4	14	RTS4
15	TXD4	16	CTS4
17	DTR4	18	RI4
19	GND	20	N.C.

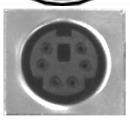


2.4.10 Keyboard and PS/2 Mouse Connector (CN11)

The board supports a PS/2 Keyboard and Mouse interface. Connector is a DIN connector for PS/2 keyboard Connection via "Y" Cable.

Pin	Signal
1	Keyboard Data
2	Mouse Data
3	GND
4	VCC
5	Keyboard Clock
6	Mouse Clock

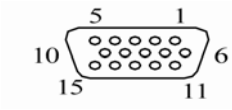


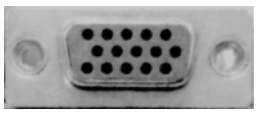


2.4.11 VGA Connector (CN13)

The board has three connectors to support CRT VGA and flat panel displays, individually or simultaneously. Connector is a slim type 15-pin D-Sub connector which is common for the CRT VGA display. The VGA interface configuration is done via the software utility, and no jumper setting is required.

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N.C.	5	GND	6	DETECT
7	GND	8	GND	9	VCC
10	GND	11	N.C.	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK

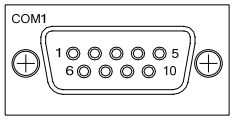




2.4.12 Serial Port1 Connector (COM1)

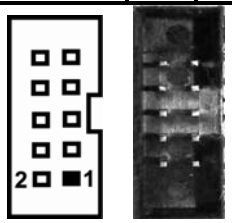
The COM 1 Port connector is a standard DB-9 connector.

Pin	Signal
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator



2.4.13 Serial Port 2 Connectors (CN15)

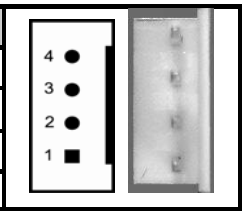
Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	N.C.



2.4.14 Power output Connector (CN8)

The CN8 can be the power supply for SATA 2.5" HD only.

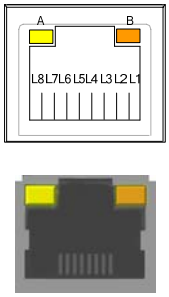
Pin	Signal
1	+12V
2	GND
3	GND
4	+5V



2.4.15 Ethernet Connectors (LAN1)

The RJ-45 connector is for Ethernet. To connect the board to a 1000/100/10 Base-T hub, just plug one end of the cable into connector and connect the other end (phone jack) to a 1000/100/10-Base-T hub.

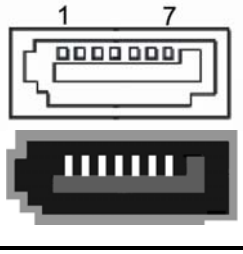
Pin	Signal	Pin	Signal
L1	MDI0+	L5	MDI2-
L2	MDI0-	L6	MDI1-
L3	MDI1+	L7	MDI3+
L4	MDI2+	L8	MDI3-
A	Active LED (Yellow)		
B	100 LAN LED (Green)/ 1000 LAN LED (Orange)		



2.4.16 SATA Connectors (SATA1, SATA2)

These SATA connectors are for high-speed SATA interface ports and they can be connected to hard disk devices.

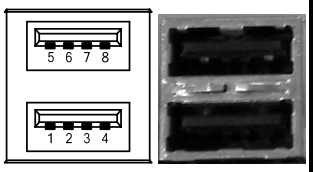
Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+



7	GND	

2.4.17 USB Port Connector (USB3)

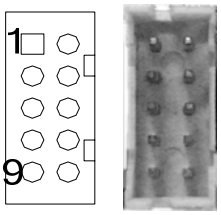
Pin	Signal	Pin	Signal
1	USB VCC0 (+5VS)	5	USB VCC0 (+5VS)
2	USB D0-	6	USB D1-
3	USB D0+	7	USB D1+
4	Ground (GND)	8	Ground (GND)



2.4.18 Internal USB Connector (USB1)

These Universal Serial Bus (USB) connectors on this board are for installing versatile USB interface peripherals. This is a 10-pin standard USB connector**.**

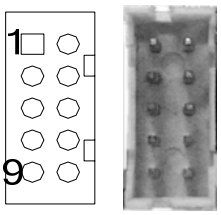
Pin	Signal	Pin	Signal
1	USB VCC1 (5VSBY)	2	USB VCC1 (5VSBY)
3	USB D2-	4	USB D3-
5	USB D2+	6	USB D3+
7	Ground (GND)	8	Ground (GND)
9	Ground (GND)	10	Ground (GND)



2.4.19 Internal USB Connector (USB4)

These Universal Serial Bus (USB) connectors on this board are for installing versatile USB interface peripherals. This is a 10-pin standard USB connector.

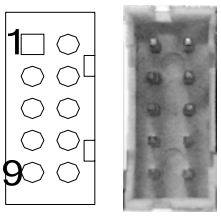
Pin	Signal	Pin	Signal
1	USB VCC2 (+5VS)	2	USB VCC2 (+5VS)
3	USB D4	4	USB D5-
5	USB D4+	6	USB D5+
7	Ground (GND)	8	Ground (GND)
9	Ground (GND)	10	Ground (GND)



2.4.20 Internal USB Connector (USB2)

These Universal Serial Bus (USB) connectors on this board are for installing versatile USB interface peripherals. This is a 10-pin standard USB connector**.**

Pin	Signal	Pin	Signal
1	USB VCC3 (+5VS)	2	USB VCC3 (+5VS)
3	USB D6-	4	USB D7-(Optional)
5	USB D6+	6	USB D7+(Optional)
7	Ground (GND)	8	Ground (GND)
9	Ground (GND)	10	Ground (GND)



2.4.21 CompactFlash™ Socket (SCF1)

The board is equipped with a CompactFlash™ disk type-II socket on the solder side to support an IDE interface CompactFlash™ disk card with DMA mode supported. The socket is especially designed to avoid incorrect installation of the CompactFlash™ disk card. When installing or removing the CompactFlash™ disk card, please make sure the system power is off. The CompactFlash™ disk card is defaulted as the C: or D: disk drive in your PC system.

Pin	Signal	Pin	Signal
1	GND	26	CD1-
2	Data 3	27	Data 11
3	Data 4	28	Data 12
4	Data 5	29	Data 13
5	Data 6	30	Data 14
6	Data 7	31	Data 15
7	CS0#	32	CS1#
8	Address 10	33	VS1#
9	ATASEL	34	IORD#
10	Address 9	35	IOWR#
11	Address 8	36	WE#
12	Address 7	37	INTR
13	VCC	38	VCC
14	Address 6	39	CSEL#
15	Address 5	40	VS2#
16	Address 4	41	RESET#
17	Address 3	42	IORDY#
18	Address 2	43	DMAREQ
19	Address 1	44	DMAACK-
20	Address 0	45	DASP#
21	Data 0	46	PDIAG#
22	Data 1	47	Data 8
23	Data 2	48	Data 9
24	IOCS16#	49	Data 10
25	CD2#	50	GND

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

CHAPTER 3
HARDWARE DESCRIPTION

3.1 Microprocessors

The **SBC84833** Series supports Intel® Atom™ processor N270, which make your system operated under Windows XP and Windows VISTA environments.The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

3.2 BIOS

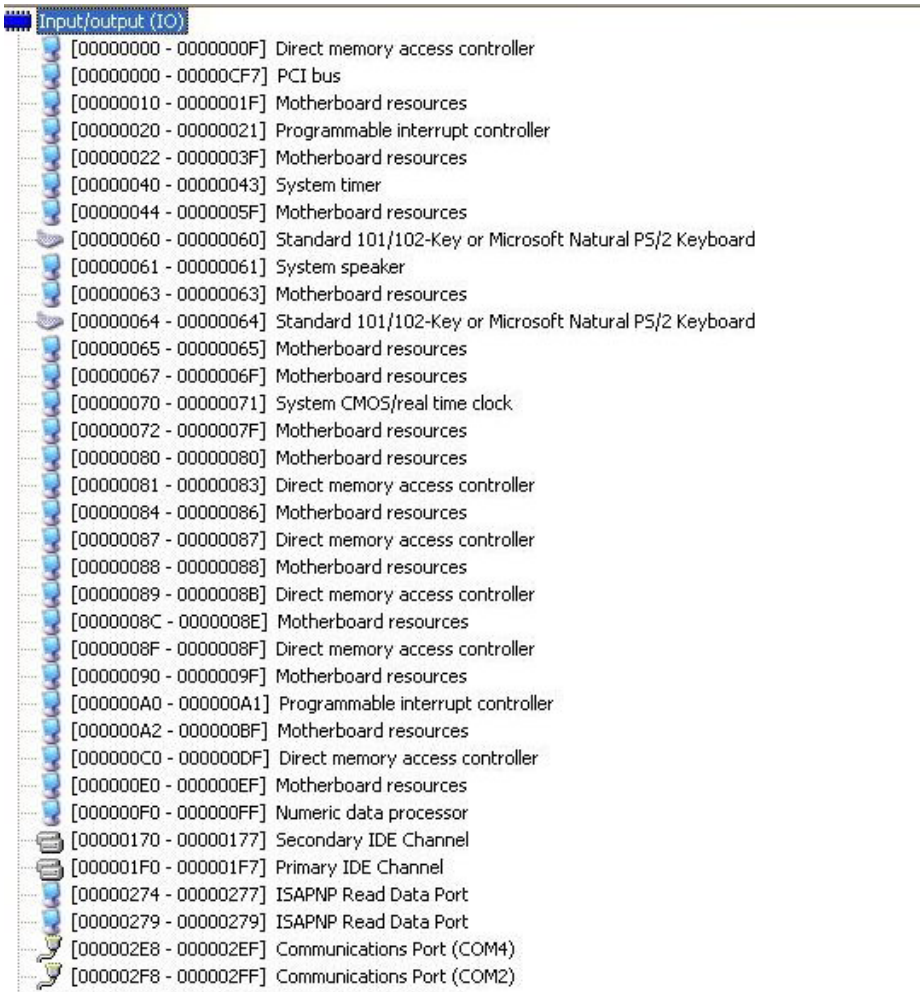
The **SBC84833** Series uses AMI Plug and Play BIOS with a single 8Mbit SPI Flash, DMI, Plug and Play.

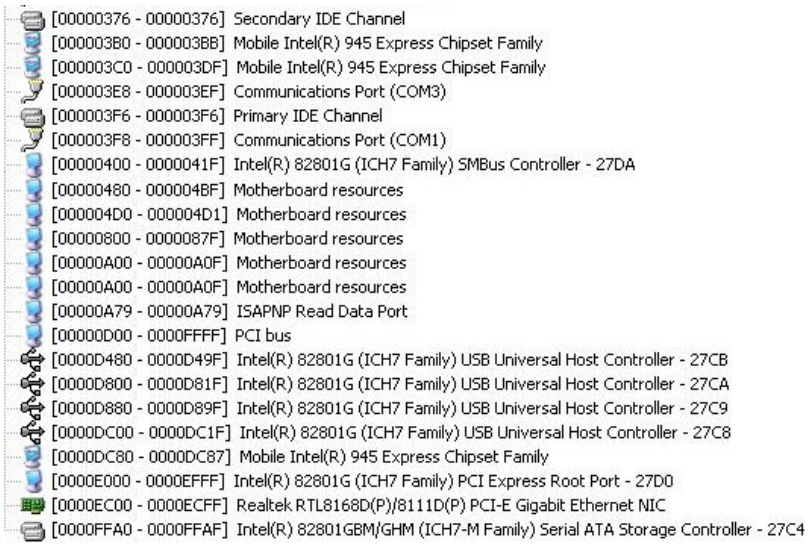
3.3 System Memory

The **SBC84833** Series industrial CPU card supports one 200-pin unbuffered DDR2 SO-DIMM sockets for a maximum memory of 2GB DDR2 SDRAMs. The memory module can come in sizes of 128MB, 256MB, 512MB and 1GB.

3.4 I/O Port Address Map

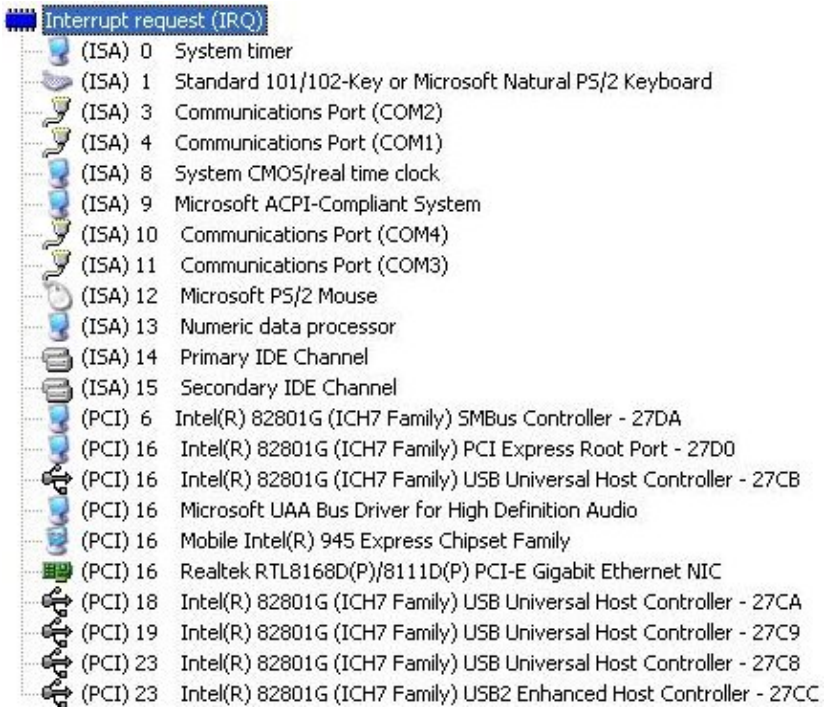
There are total 1KB port addresses (under OS WinXP) available for assignment to other devices via I/O expansion cards.


Input/output (IO)
[00000000 - 0000000F] Direct memory access controller
[00000000 - 00000CF7] PCI bus
[00000010 - 0000001F] Motherboard resources
[00000020 - 00000021] Programmable interrupt controller
[00000022 - 0000003F] Motherboard resources
[00000040 - 00000043] System timer
[00000044 - 0000005F] Motherboard resources
[00000060 - 00000060] Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000061 - 00000061] System speaker
[00000063 - 00000063] Motherboard resources
[00000064 - 00000064] Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000065 - 00000065] Motherboard resources
[00000067 - 0000006F] Motherboard resources
[00000070 - 00000071] System CMOS/real time clock
[00000072 - 0000007F] Motherboard resources
[00000080 - 00000080] Motherboard resources
[00000081 - 00000083] Direct memory access controller
[00000084 - 00000086] Motherboard resources
[00000087 - 00000087] Direct memory access controller
[00000088 - 00000088] Motherboard resources
[00000089 - 0000008B] Direct memory access controller
[0000008C - 0000008E] Motherboard resources
[0000008F - 0000008F] Direct memory access controller
[00000090 - 0000009F] Motherboard resources
[000000A0 - 000000A1] Programmable interrupt controller
[000000A2 - 000000BF] Motherboard resources
[000000C0 - 000000DF] Direct memory access controller
[000000E0 - 000000EF] Motherboard resources
[000000F0 - 000000FF] Numeric data processor
[00000170 - 00000177] Secondary IDE Channel
[000001F0 - 000001F7] Primary IDE Channel
[00000274 - 00000277] ISAPNP Read Data Port
[00000279 - 00000279] ISAPNP Read Data Port
[000002E8 - 000002EF] Communications Port (COM4)
[000002F8 - 000002FF] Communications Port (COM2)


[00000376 - 00000376] Secondary IDE Channel
[000003B0 - 000003BB] Mobile Intel(R) 945 Express Chipset Family
[000003C0 - 000003DF] Mobile Intel(R) 945 Express Chipset Family
[000003E8 - 000003EF] Communications Port (COM3)
[000003F6 - 000003F6] Primary IDE Channel
[000003F8 - 000003FF] Communications Port (COM1)
[00000400 - 0000041F] Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
[00000480 - 000004BF] Motherboard resources
[000004D0 - 000004D1] Motherboard resources
[00000800 - 0000087F] Motherboard resources
[00000A00 - 00000A0F] Motherboard resources
[00000A00 - 00000A0F] Motherboard resources
[00000A79 - 00000A79] ISAPNP Read Data Port
[00000D00 - 0000FFFF] PCI bus
[0000D480 - 0000D49F] Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
[0000D800 - 0000D81F] Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
[0000D880 - 0000D89F] Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
[0000DC00 - 0000DC1F] Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
[0000DC80 - 0000DC87] Mobile Intel(R) 945 Express Chipset Family
[0000E000 - 0000EFFF] Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[0000EC00 - 0000ECFF] Realtek RTL8168D(P)/8111D(P) PCI-E Gigabit Ethernet NIC
[0000FFA0 - 0000FFAF] Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4

3.5 Interrupt Controller

The **SBC84833 Series** is a 100% PC compatible control board. It consists of 16 interrupt request lines, and four out of them can be programmable. The mapping list of the 16 interrupt request lines is shown as the following table.


Interrupt request (IRQ)
(ISA) 0 System timer
(ISA) 1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
(ISA) 3 Communications Port (COM2)
(ISA) 4 Communications Port (COM1)
(ISA) 8 System CMOS/real time clock
(ISA) 9 Microsoft ACPI-Compliant System
(ISA) 10 Communications Port (COM4)
(ISA) 11 Communications Port (COM3)
(ISA) 12 Microsoft PS/2 Mouse
(ISA) 13 Numeric data processor
(ISA) 14 Primary IDE Channel
(ISA) 15 Secondary IDE Channel
(PCI) 6 Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
(PCI) 16 Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
(PCI) 16 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
(PCI) 16 Microsoft UAA Bus Driver for High Definition Audio
(PCI) 16 Mobile Intel(R) 945 Express Chipset Family
(PCI) 16 Realtek RTL8168D(P)/8111D(P) PCI-E Gigabit Ethernet NIC
(PCI) 18 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
(PCI) 19 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
(PCI) 23 Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
(PCI) 23 Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC

CHAPTER 4
AMI BIOS SETUP UTILITY

This chapter provides users with detailed description about how to set up basic system configuration through the AMIBIOS8 BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:
1. Turn on the computer and press the <Del> key immediately.
2. After pressing the <Delete> key, the main BIOS setup menu displays. You can access to other setup screens from the main BIOS setup menu, such as the Chipset and Power menus.

4.2 Navigation Keys

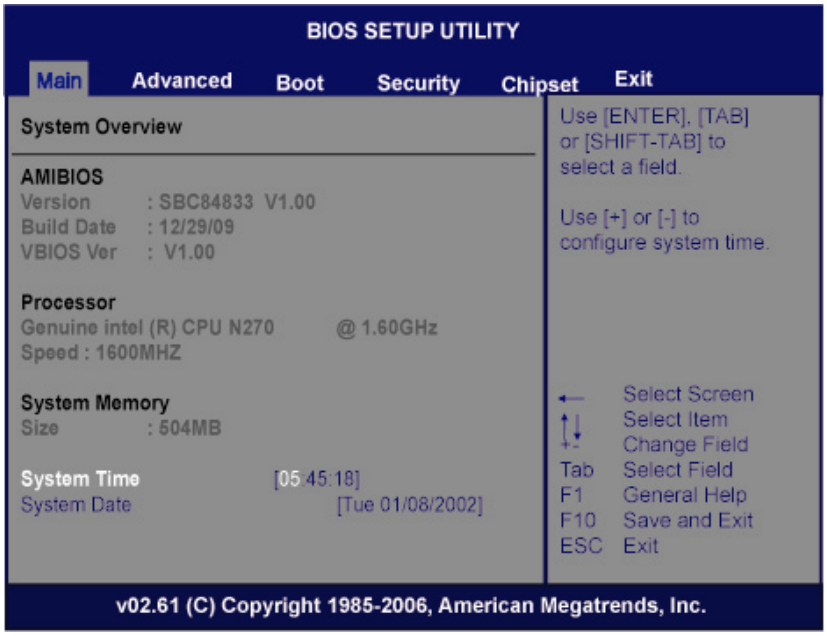
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.
These keys include <F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, and so on.

Note *Some of navigation keys differ from one screen to another.*

← Left/Right	The Left and Right <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F10	The <F10> key allows you to save any changes you have made and exit Setup. Press the <F10> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

4.3 Main Menu

When you first enter the Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



- **System Time/Date**

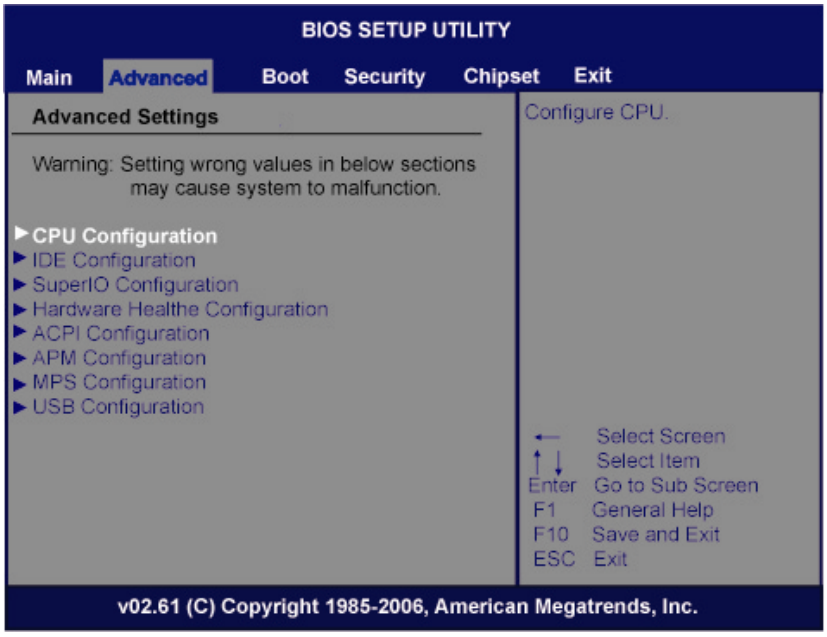
  Use this option to change the system time and date. Highlight *System Time* or *System Date* using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

4.4 Advanced Menu

The Advanced menu allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

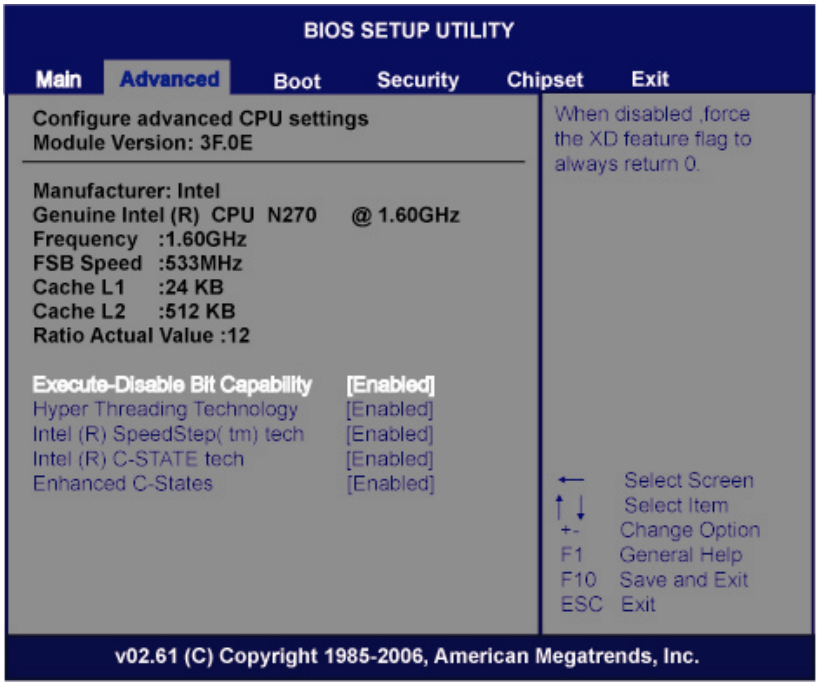
- CPU Configuration
- IDE Configuration
- SuperIO Configuration
- Hardware Health Configuration
- ACPI Configuration
- APM Configuration
- MPS Configuration
- USB Configuration

For items marked with "▶", please press <Enter> for more options.



- **Configure advanced CPU settings**

This screen shows the CPU Configuration, and you can change the value of the selected option.



- **Execute-Disable Bit Capability**

This item helps you enable or disable the No-Execution Page Protection Technology.

- **Hyper Threading Technology**

Use this item to enable or disable Hyper-Threading Technology, which makes a single physical processor perform multi-tasking function as two logical ones.

- **Intel (R) SpeedStep (tm) tech**

Use this item to enable or disable the Intel SpeedStep Technology.

➢ **Intel (R) C-STATE tech**

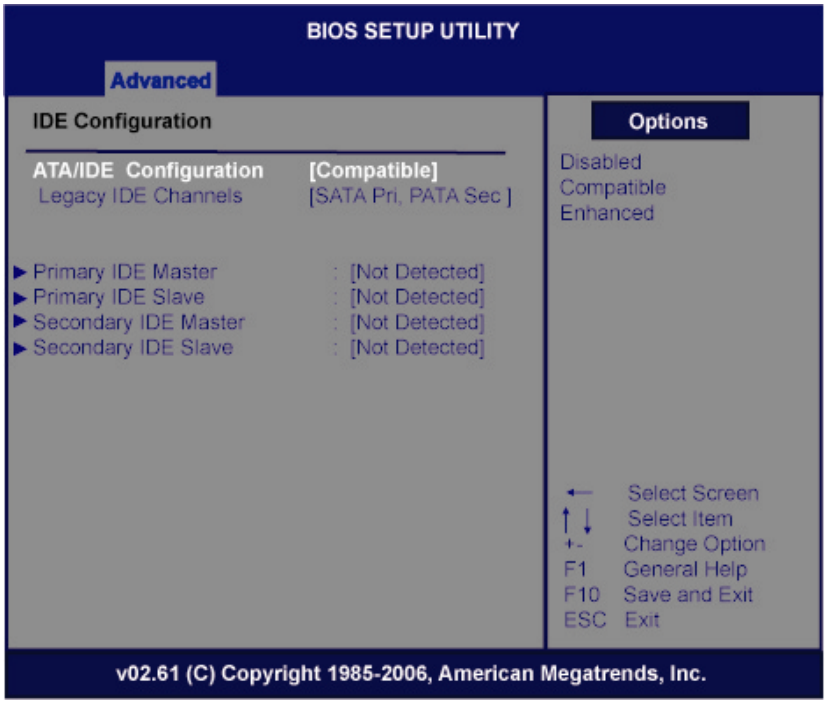
Use this item to enable or disable the C-State technology.

➢ **Enhanced C-States**

Use this item to enable or disable any available enhanced C-states (C1E, C2E, C3E, C4E and Hard C4E).

- **IDE Configuration**

Use this screen to select options for the IDE Configuration and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "►", please press <Enter> for more options.



➢ **ATA/IDE Configuration**

Use this item to specify the integrated IDE controller. There are three options for your selection: *Disabled*, *Compatible* and *Enhanced*.

➢ **Legacy IDE Channels**

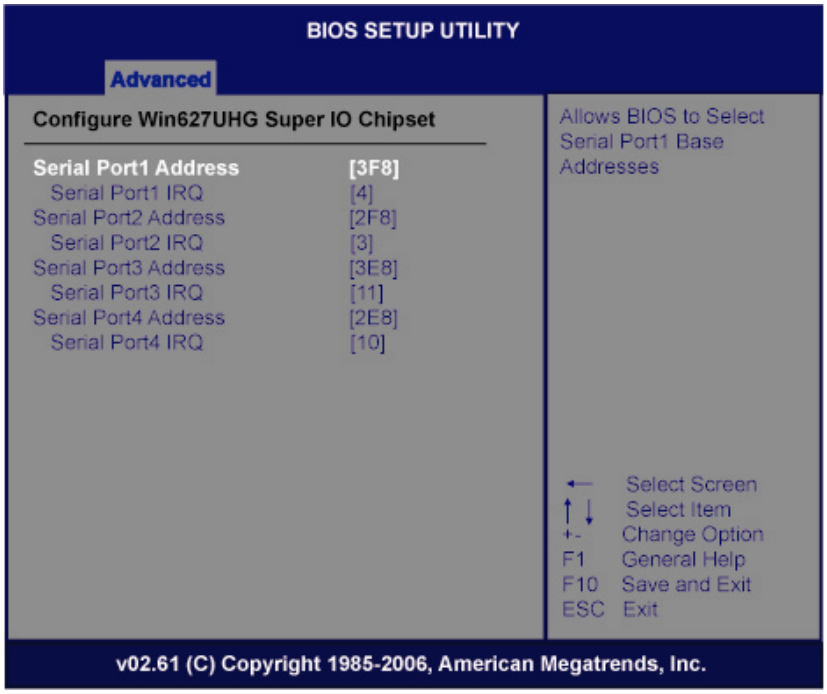
When the ATA/IDE Configuration is set to *Compatible*, this item will be displayed.

➢ **Primary/Secondary/Third IDE Master/Slave**

Select one of the hard disk drives to configure IDE devices installed in the system by pressing <Enter> for more options.

- **SuperIO Configuration**

Use this screen to select options for the SuperIO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



- **Serial Port1 Address**

  This item specifies the base I/O port address and Interrupt Request address of serial port 1. The Optimal setting is *3F8/IRQ4*. The Fail-Safe default setting is *Disabled*.

- **Serial Port1 IRQ**

  This item specifies the IRQ used by the serial port 1.

- **Serial Port2 Address**

  This item specifies the base I/O port address and Interrupt Request address of serial port 2. The Optimal setting is *2F8/IRQ3*. The Fail-Safe setting is *Disabled*.

- **Serial Port2 IRQ**

  This item specifies the IRQ used by the serial port 2.

- **Serial Port2 Mode**

  This item specifies the mode used by the serial port 2.

- **Serial Port3 Address**

  This item specifies the base I/O port address and Interrupt Request address of serial port 3.

- **Serial Port3 IRQ**

  This item specifies the IRQ used by the serial port 3.

- **Serial Port4 Address**

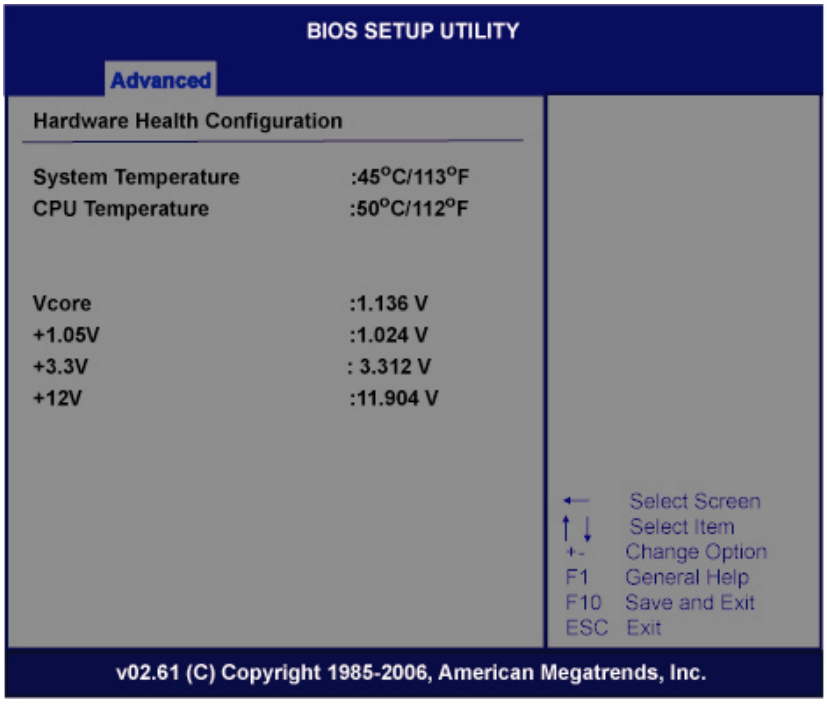
  This item specifies the base I/O port address and Interrupt Request address of serial port 4.

- **Serial Port4 IRQ**

  This item specifies the IRQ used by the serial port 4.

- **Hardware Health Configuration**

  This screen shows the Hardware Health Configuration, and a description of the selected item appears on the right side of the screen.

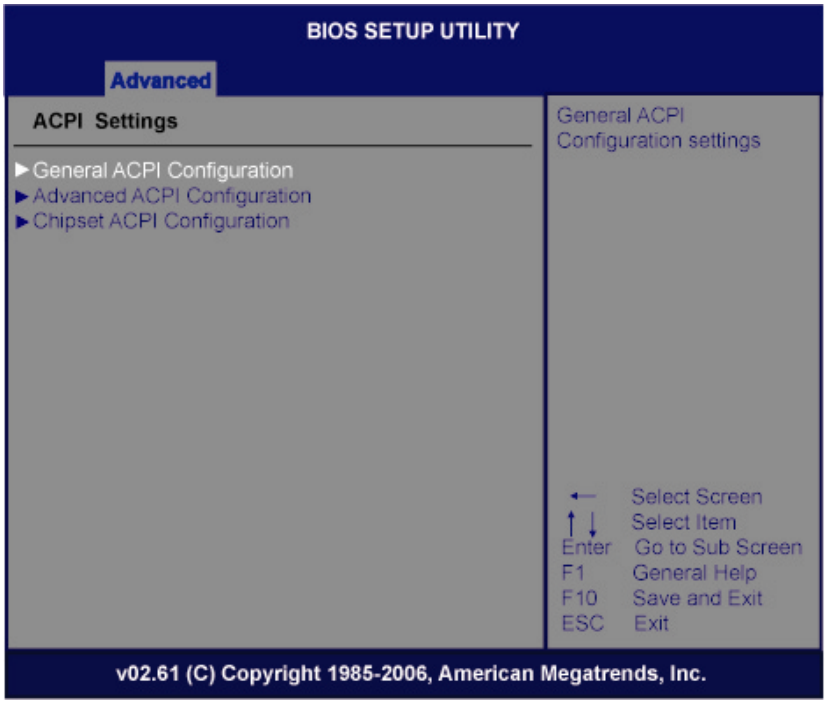


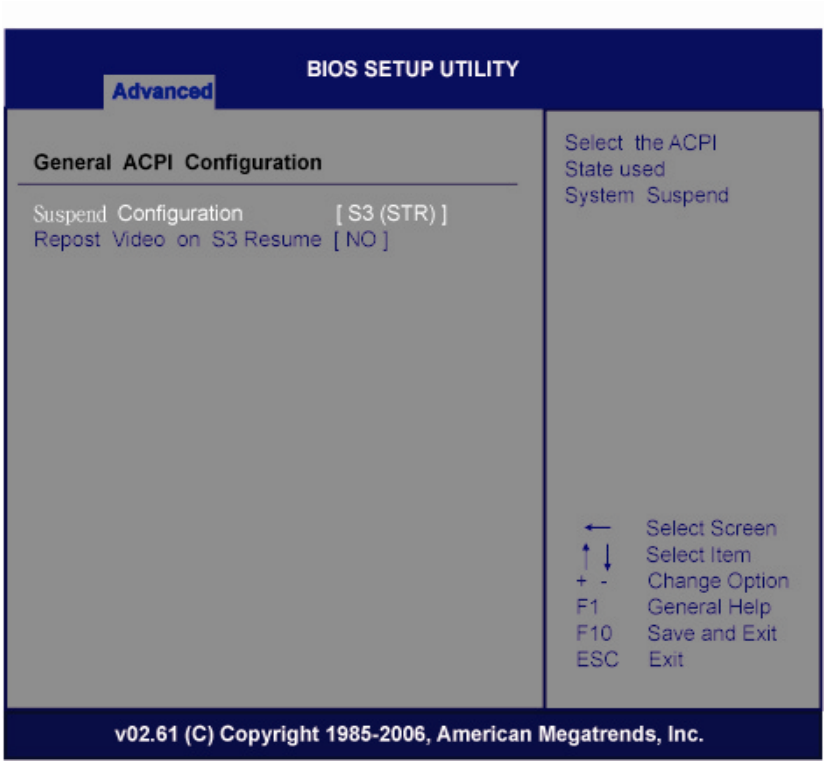
  - **System Temperature/CPU Temperature**

    These items display the temperature of CPU and System, Vcore, etc.

- **ACPI Settings**

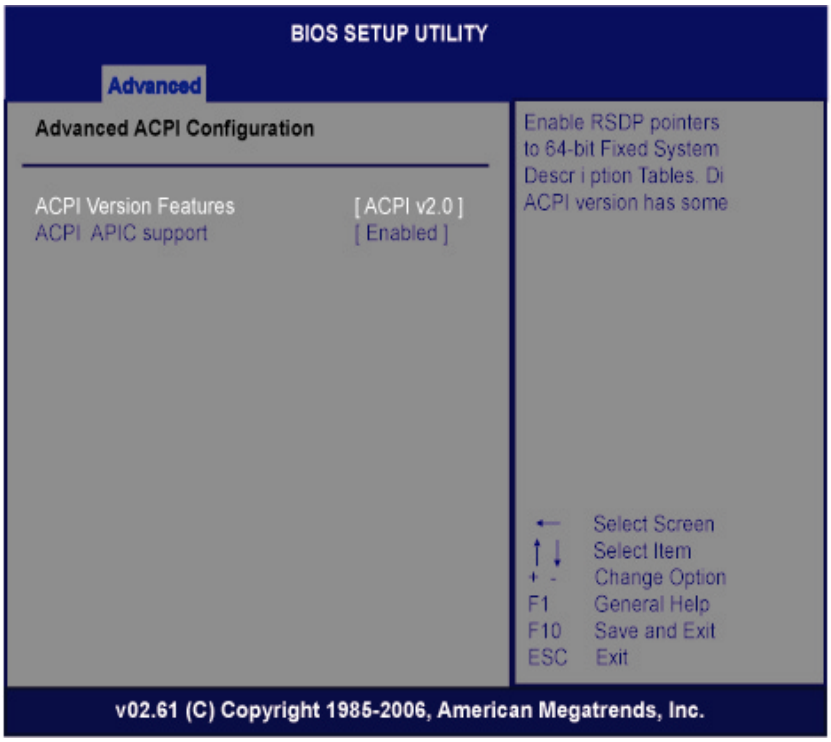
  Use this screen to select options for the ACPI Settings, and change the value of the selected option. A description of the selected item appears on the right side of the screen.




BIOS SETUP UTILITY
Advanced
General ACPI Configuration
Suspend Configuration [S3 (STR)]
Repost Video on S3 Resume [NO]
Select the ACPI State used System Suspend
Select Screen
Select Item
+ - Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C) Copyright 1985-2006, American Megatrends, Inc.

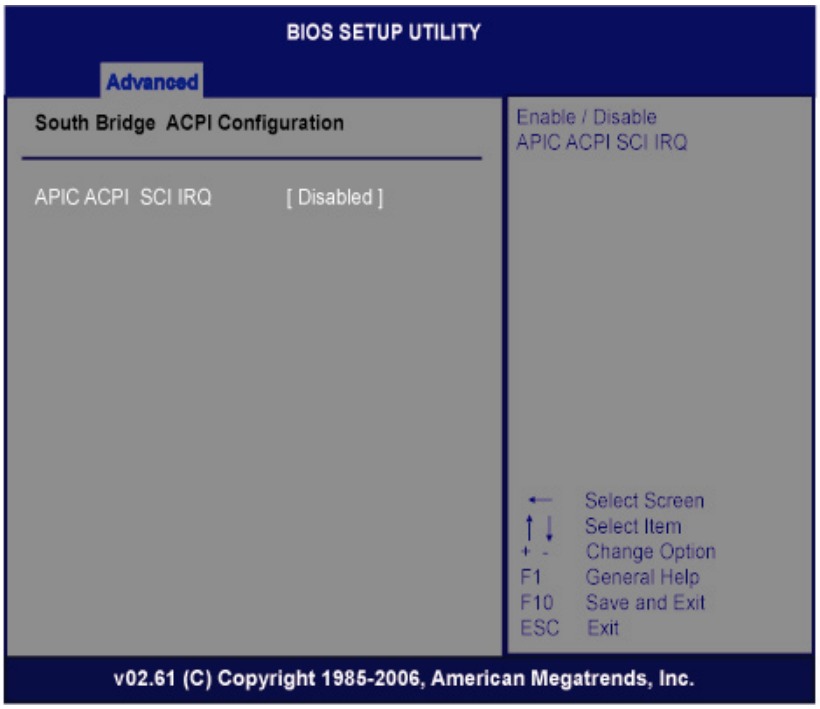
- **General ACPI Configuration**

  Scroll this item and press <Enter> to view the General ACPI Configuration sub menu, which contains General ACPI (Advanced Configuration and Power Management Interface) options for your configuration.


BIOS SETUP UTILITY
Advanced
Advanced ACPI Configuration
ACPI Version Features [ACPI v2.0]
ACPI APIC support [Enabled]
Enable RSDP pointers to 64-bit Fixed System Descr i ption Tables. Di ACPI version has some
Select Screen
Select Item
+ - Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C) Copyright 1985-2006, American Megatrends, Inc.

➢ **Advanced ACPI Configuration**

Scroll this item and press <Enter> to view the Advanced ACPI Configuration sub menu, which contains Advanced ACPI (Advanced Configuration and Power Management Interface) options for your configuration.

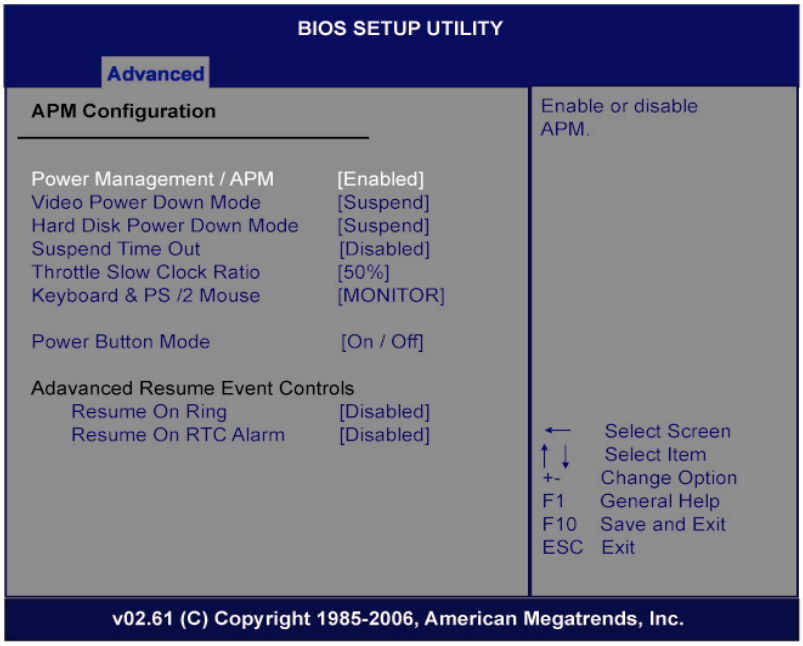


➢ **Chipset ACPI Configuration**

Scroll this item and press <Enter> to view the Chipset ACPI Configuration sub menu, which contains Chipset ACPI (Advanced Configuration and Power Management Interface) options for your configuration.

- **APM Configuration**

  Use this screen to select options for the APM Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.


BIOS SETUP UTILITY
Advanced
APM Configuration
Power Management / APM [Enabled]
Video Power Down Mode [Suspend]
Hard Disk Power Down Mode [Suspend]
Suspend Time Out [Disabled]
Throttle Slow Clock Ratio [50%]
Keyboard & PS /2 Mouse [MONITOR]
Power Button Mode [On / Off]
Adavanced Resume Event Controls
Resume On Ring [Disabled]
Resume On RTC Alarm [Disabled]
Enable or disable APM.
← Select Screen
↑ ↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C) Copyright 1985-2006, American Megatrends, Inc.

  - **Power Management/APM**

    Set this item to allow Power Management/APM support. The default setting is *Enabled*.

Disabled	Set this item to prevent the chipset power management and APM (Advanced Power Management) features.
Enabled	Set this item to allow the chipset power management and APM (Advanced Power Management) features. This is the default setting.

- **Video Power Down Mode**

This option specifies the Power State. When the BIOS places it in a power saving state, the video subsystem enters after the specified period of display inactivity has expired. The default setting is *Suspend*.

Disabled	This setting prevents the BIOS from initiating any power saving modes concerned with the video display or monitor.
Suspend	This option places the monitor into suspend mode after the specified period of display inactivity has expired. This means the monitor is not off. The screen will appear blacked out. The standards do not cite specific power ratings because they vary from monitor to monitor, but this setting use less power than Standby mode. This is the default setting.

- **Hard Disk Drive Power Down Mode**

This option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired. The default setting is *Suspend*.

Disabled	This setting prevents hard disk drive power down mode.
Suspend	This option cuts the power to the hard disk drives during a system suspend. This is the default setting.

- **Suspend Time Out (Minute)**

This option specifies the length of time the system waits before it enters suspend mode. The default setting is *Disabled*.

Disabled	This setting prevents the system from entering suspend mode. This is the default setting.
1 Min	Set this item to allow the computer system to enter suspend mode after being inactive for 1 minute.
4 Min	Set this item to allow the computer system to enter suspend mode after being inactive for 4 minutes.
10 Min	Set this item to allow the computer system to enter suspend mode after being inactive for 10 minutes.

Throttle Slow Clock Ratio

Use this item to specify the speed of the system clock when running the power saving states.

- **Power Button Mode**

This option specifies how the externally mounted power button on the front of the computer chassis is used. The default setting is *On/Off*.

On/Off	Pushing the power button turns the computer on or off. This is the default setting. This is the default setting.
Suspend	Pushing the power button places the computer in Suspend mode or Full On power mode.

- ***** Advanced Resume Event Controls *****

- **Resume On Ring**

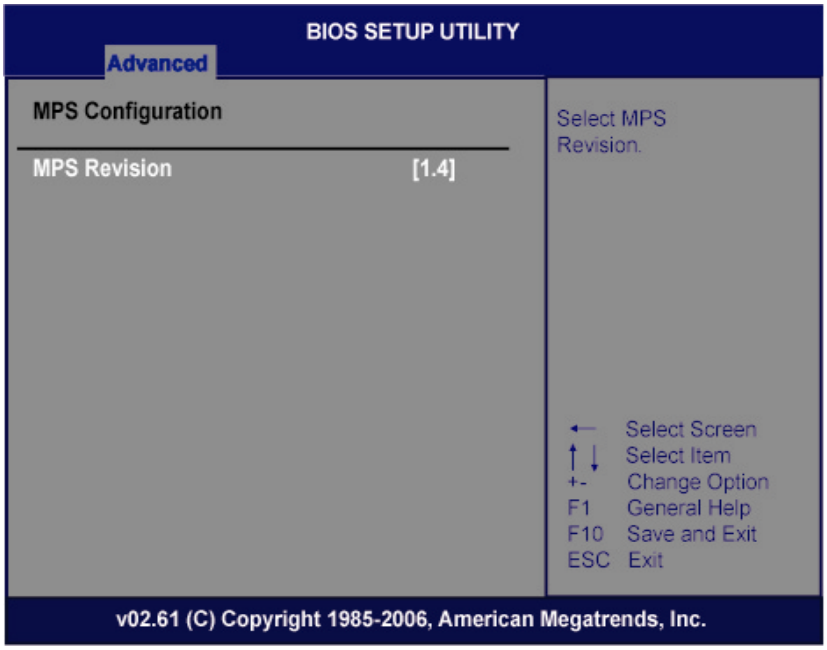
This item enables or disables the function of Resume On Ring that resumes the system through incoming calls.

- **Resume On RTC Alarm**

You can set "Resume On RTC Alarm" item to enabled and key in Data/time to power on system.

- **MPS Configuration**

  This screen shows the MPS (Multi Processor Specification) Configuration, and you can change its value. A description of the selected item appears on the right side of the screen.

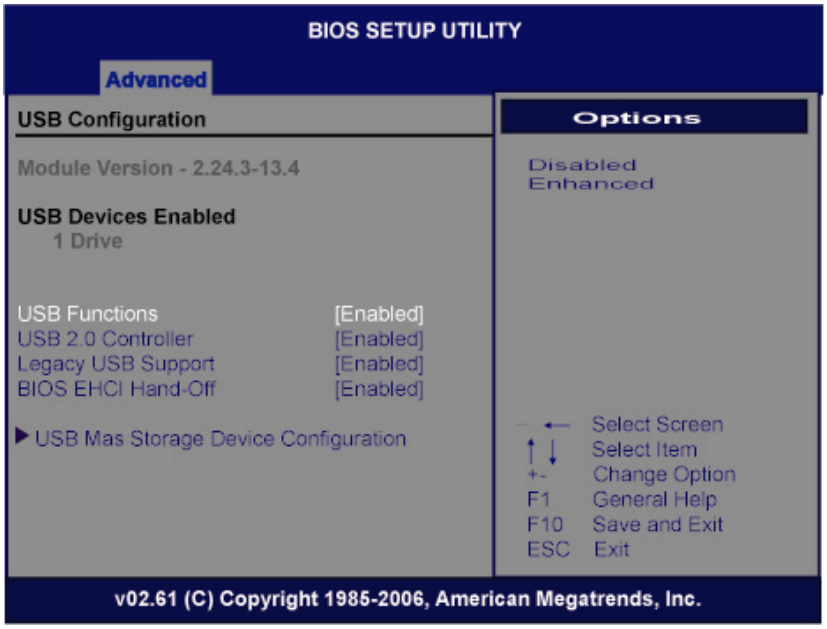


  - **MPS Revision**

    Use this item to select MPS (Multi Processor Specification) Revision 1.1 or 1.4. The default setting is *1.4*.

- **USB Configuration**

  You can use this screen to select options for the USB Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



  - **USB Function**

    Use this item to enable or disable USB function.

  - **USB 2.0 Controller**

    Use this item to enable or disable the USB 2.0 controller.

  - **Legacy USB Support**

    Use this item to enable or disable support for USB device on legacy operating system. The default setting is *Enabled*.

- **BIOS EHCI Hand-Off**

  Enabling this item provides the support for operating systems without an EHCI hand-off feature. The default setting is *Enabled*.

- **USB Mass Storage Device Configuration**

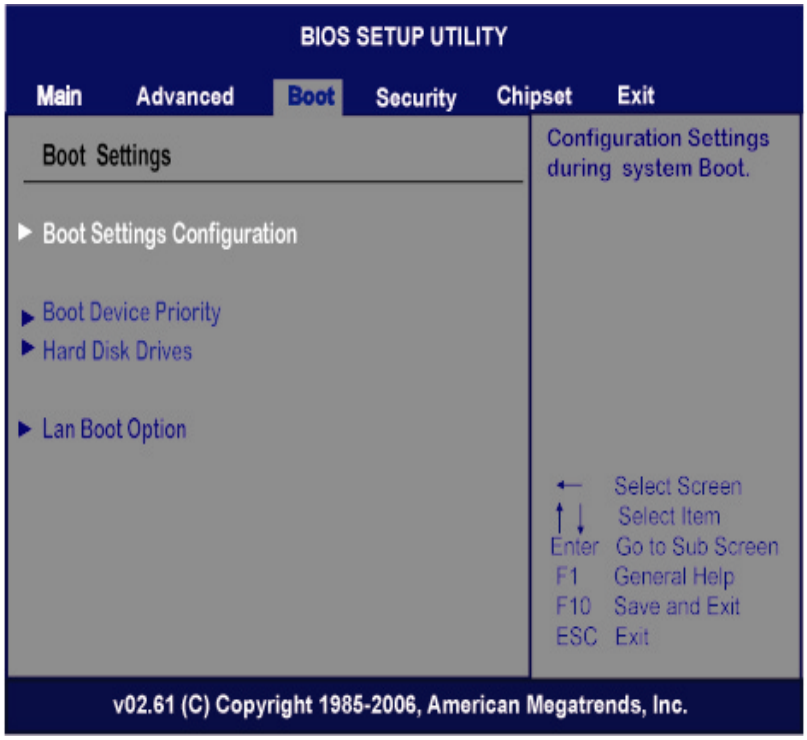
  Scroll this item and press <Enter> to view the USB Mass Storage Device Configuration sub menu, which contains several options for your configuration.

4.5 Boot Menu

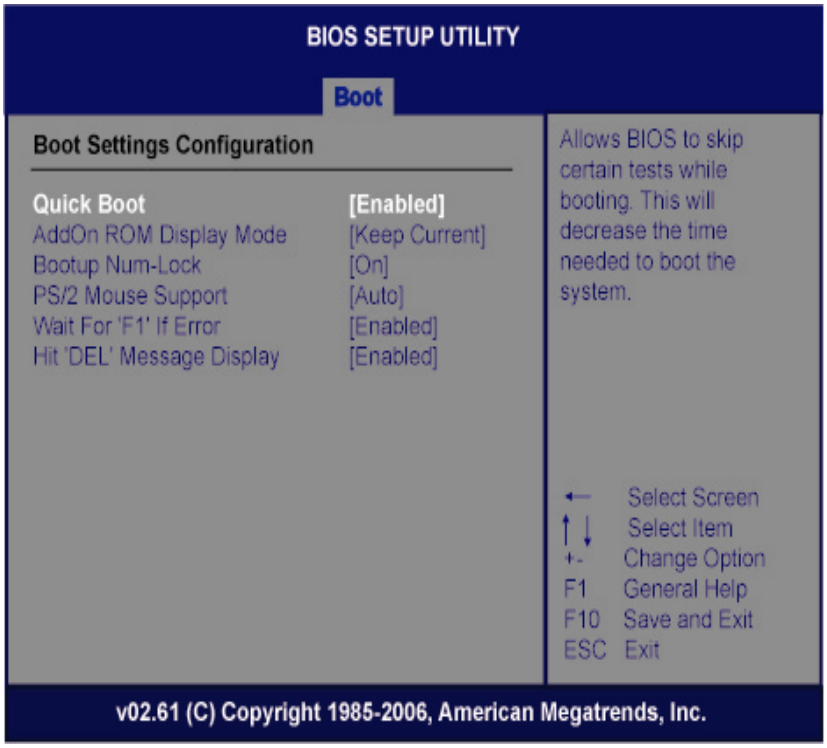
The Boot menu allows users to change boot options of the system. You can select any of the items in the left frame of the screen to go to the sub menus:

- Boot Settings Configuration
- Boot Device Priority
- Hard Disk Drives
- Lan Boot Option

For items marked with "►", please press <Enter> for more options.



- **Boot Settings Configuration**


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
AddOn ROM Display Mode [Keep Current]
Bootup Num-Lock [On]
PS/2 Mouse Support [Auto]
Wait For 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
Select Screen
Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C) Copyright 1985-2006, American Megatrends, Inc.

➢ **Quick Boot**

Enabling this item lets the BIOS skip some power on self tests (POST). The default setting is *Enabled*.

➢ **AddOn ROM Display Mode**

This item selects the display mode for option ROM. The default setting is *Force BIOS*.

➢ **Boot Num-Lock**

Use this item to select the power-on state for the NumLock. The default setting is *On*.

- **PS/2 Mouse Support**

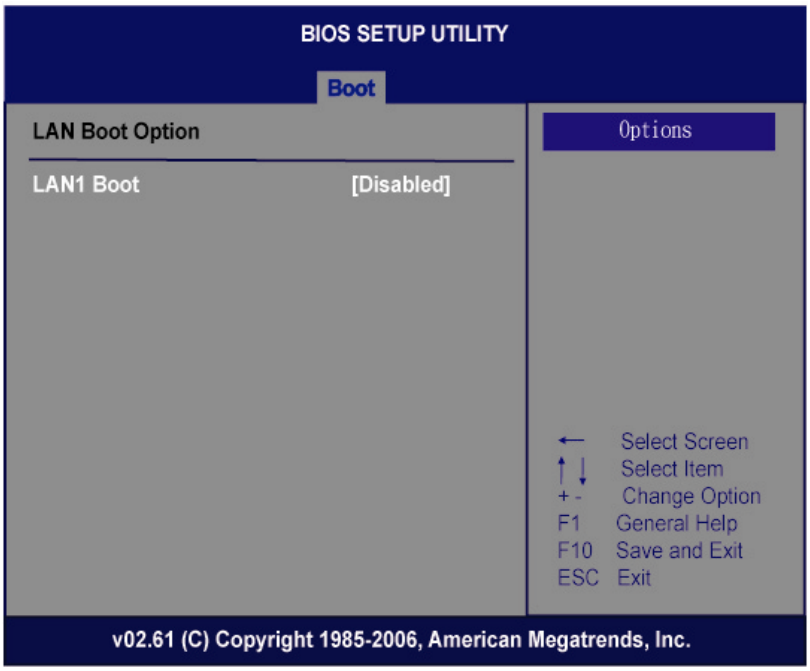
This item determines if the BIOS should reserve IRQ12 for the PS/2 mouse or allow other devices to make use of this IRQ. Here are the options for your selection, *Auto*, *Enabled* and *Disabled*.

- **Wait For 'F1' If Error**

If this item is enabled, the system waits for the F1 key to be pressed when error occurs. The default setting is *Enabled*.

- **Hit 'DEL' Message Display**

If this item is enabled, the system displays the message "Press DEL to run Setup" during POST. The default setting is *Enabled*.

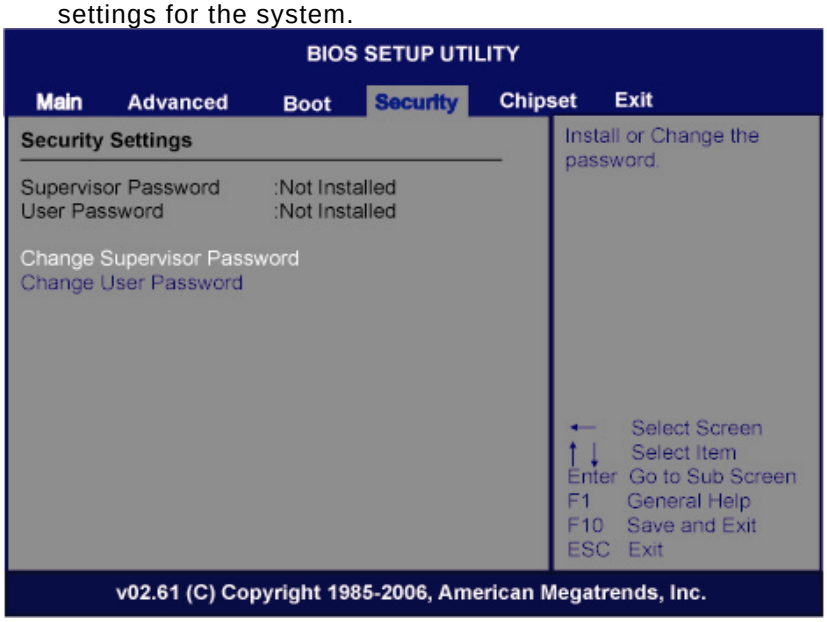


- **LAN1 Boot**

Use these items to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up.

4.6 Security Menu

The Security menu allows users to change the security settings for the system.



- **Supervisor Password**

This item indicates whether a supervisor password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.

- **User Password**

This item indicates whether a user password has been set. If the password has been installed, Installed displays. If not, Not Installed displays.

- **Change Supervisor Password**

Select this option and press <Enter> to access the sub menu. You can use the sub menu to change the supervisor password.

- **Change User Password**

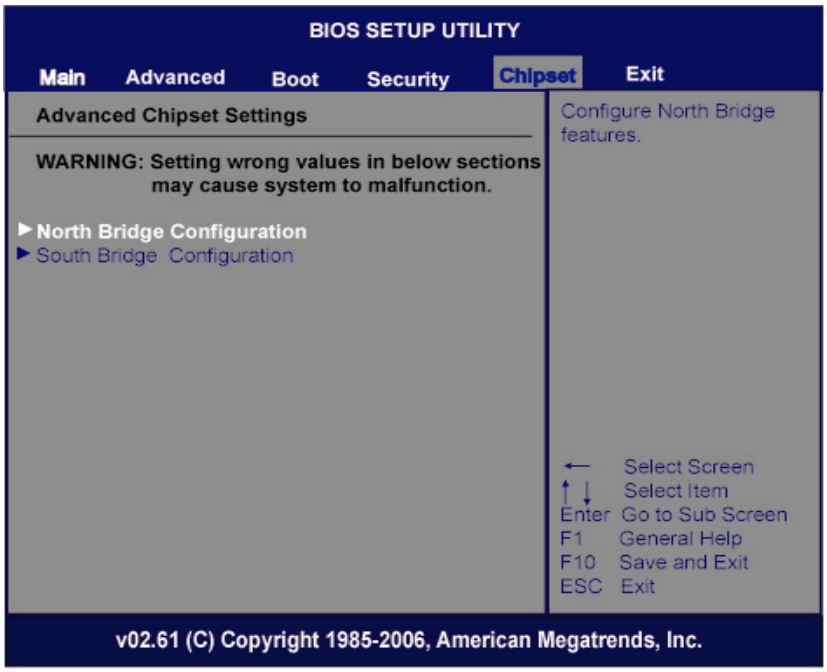
Select this option and press <Enter> to access the sub menu. You can use the sub menu to change the user password.

4.7 Chipset Menu

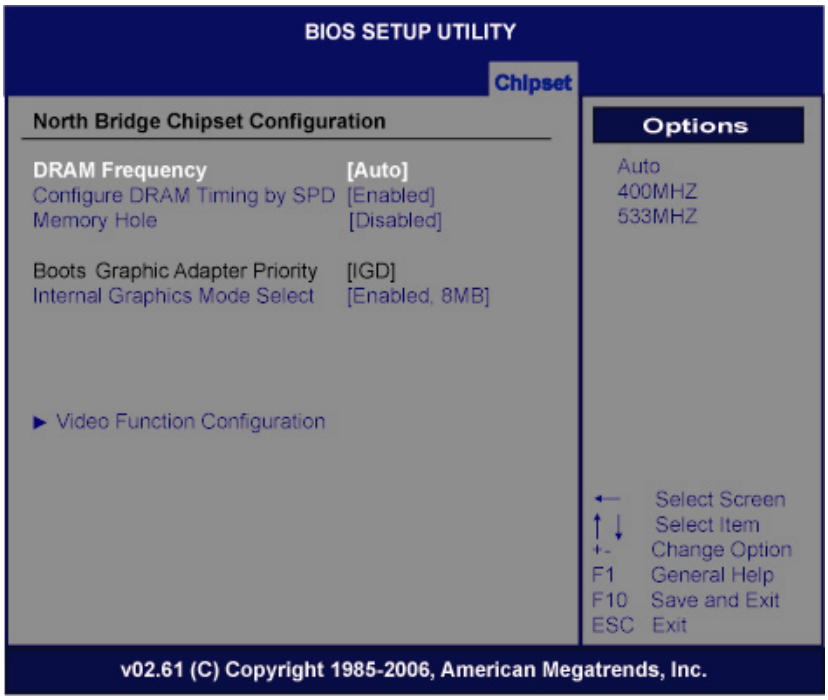
The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

- North Bridge Configuration
- South Bridge Configuration

For items marked with "►", please press <Enter> for more options.



- **North Bridge Configuration**



➢ **DRAM Frequency**

Use this item to control the Memory Clock.

➢ **Configure DRAM Timing by SPD**

Use this item to enable or disable DRAM timing by SPD (Serial Presence Detect) device, which is a small EEPROM chip on the memory module, containing important information about the module speed, size, addressing mode and various parameters.

➢ **Memory Hole**

This area of system memory can be reserved for ISA adapter ROM. When this area is reserved it cannot be cached. Check the user information of peripherals that need to use this area of system memory for the memory requirements. Here are the options, *Disabled* and *15M-16M*.

- **Boot Graphic Adapter Priority**

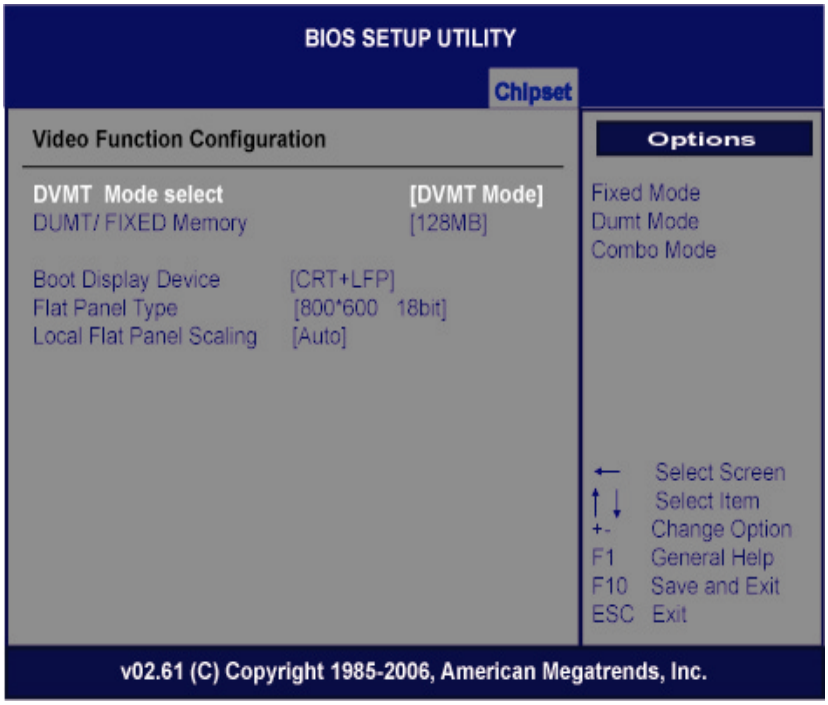
  This item allows you to select the graphics controller as the primary boot device.

- **Internal Graphics Mode Select**

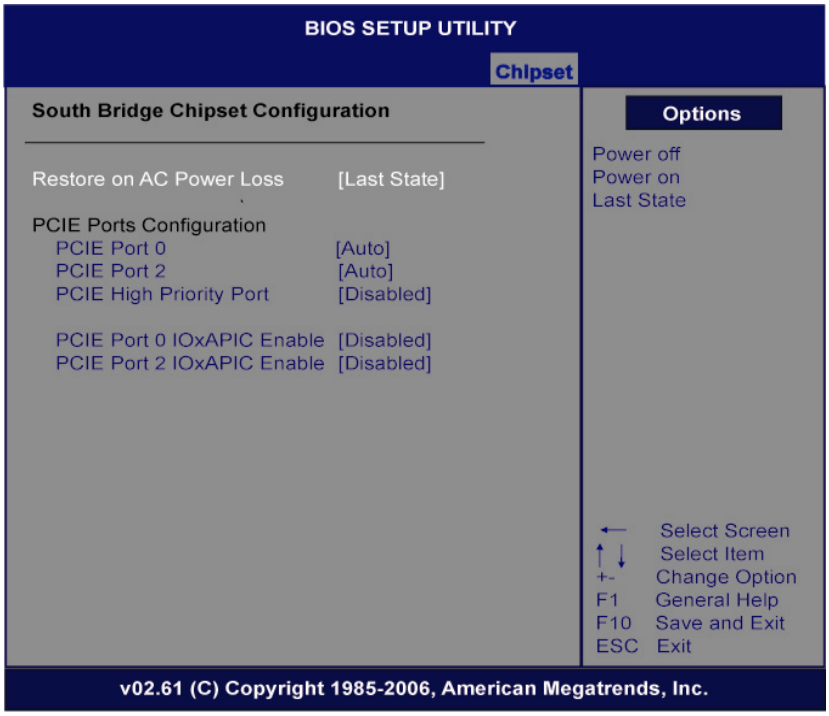
  This item allows you to select the amount of system memory used by the internal graphics device.

- **Video Function Configuration**

  Press <Enter> for the sub-menu for setting up video function.



- **South Bridge Configuration**



➢ **Restore on AC Power Loss**

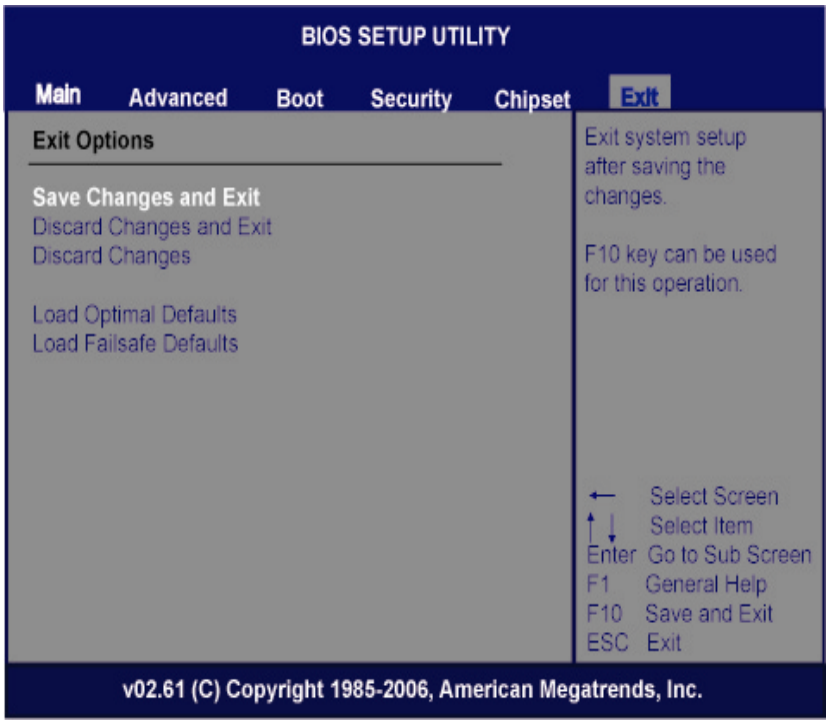
This item can control how the PC will behave once power is restored following a power outage, or other unexpected shutdown.

➢ **PCIE Port Configuration**

This item allows you to set or disable the PCI Express Ports.

4.8 Exit Menu

The Exit menu allows users to load the system configuration with optimal or failsafe default values.



- **Save Changes and Exit**

  When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select *Save Changes and Exit* from the Exit menu and press <Enter>. Select Ok to save changes and exit.

- **Discard Changes and Exit**

  Select this option to quit Setup without making any permanent changes to the system configuration. Select *Discard Changes and Exit* from the Exit menu and press <Enter>. Select Ok to discard changes and exit.

- **Discard Changes**

  Use this item to abandon all changes.

- **Load Optimal Defaults**

  It automatically sets all Setup options to a complete set of default settings when you select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems. Select Load Optimal Defaults from the Exit menu and press <Enter>.

- **Load Fail-Safe Defaults**

  It automatically sets all Setup options to a complete set of default settings when you select this option. The Fail-Safe settings are designed for maximum system stability, but not maximum performance. Select the Fail-Safe Setup options if your computer is experiencing system configuration problems.
  Select Load Fail-Safe Defaults from the Exit menu and press <Enter>. Select Ok to load Fail-Safe defaults.

APPENDIX A
WATCHDOG TIMER

Watchdog Timer Setting

After the system stops working for a while, it can be auto-reset by the Watchdog Timer. The integrated Watchdog Timer can be set up in the system reset mode by program.

Using the Watchdog Function

Start
↓
Un-Lock WDT:
O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O
↓
Select Logic device:
O 2E 07
O 2F 08
↓
Activate WDT:
O 2E 30
O 2F 01
↓
Set Second or Minute :
O 2E F5
O 2F N N=00 or 08
↓
Set base timer :
O 2E F6
O 2F M=00,01,02,…FF(Hex) ,Value=0 to 255
↓

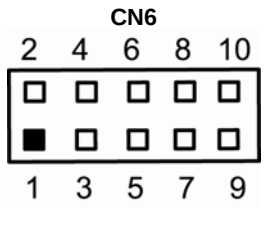
; IF to disable WDT:
O 2E 30
O 2F 00 ; Can be disable at any time

- **Timeout Value Range**
  - 1 to 255
  - Minute / Second
-
- **Program Sample**

O 2E 87	
O 2E 87	
O 2E 07	
O 2F 08	Logical Device 8
O 2E 30	Activate
O 2F 01	
O 2E F5	
O 2F N	Set Minute or Second N=08 (Min),00(Sec)
O 2E F6	
O 2F M	Set Value M = 00 ~ FF

APPENDIX B
DIGITAL I/O

Pin	Signal	Pin	Signal
1	Digital Input 0 (48D / Bit4)	2	Digital Output 0 (Value M / Bit0)
3	Digital Input 1 (48D / Bit5)	4	Digital Output 1 (Value M / Bit1)
5	Digital Input 2 (48D / Bit6)	6	Digital Output 2 (Value M / Bit2)
7	Ground (GND)	8	Digital Output 3 (Value M / Bit3)
9	Ground (GND)	10	Digital Output 4 (Value M / Bit4)



Digital I/O Software Programming

- GPI program sample:

O 2E 87	
O 2E 87	
O 2E 07	
O 2F 08	Select Device 8
O 2E 30	
O 2F 02	Set GPIO5
O 2E E0	
O 2F 07	GPIO5 pins are programmed as output pins.
O 2E E1	
I 2F	Read GPIO5 pins' value.

- GPO program sample:

O 2E 87	
O 2E 87	
O 2E 07	
O 2F 08	Select Device 8
O 2E 30	
O 2F 02	Set GPIO5
O 2E E0	
O 2F 07	GPIO5 pins are programmed as output pins.
O 2E E1	
O 2F M	Set output value M Bit 0 ~ Bit 4 (1 High , 0 Low) (GPO0~4) When M is F8, all GPIO5 pins are high.